



American Institute of Chemical Engineers Knoxville-Oak Ridge Section

For additional information see our Web site at: <http://www.ornl.gov/sci/aiche/>
Or contact: Paul Taylor, taylorpa@ornl.gov, (865)574-1965 or
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March 2016 Meeting

Date: Thursday, March 17, 2016
Cost: \$10 (Cash or Check - **NOTE**: There is no cost for the program or PDH Certificate)
Location: 2506 Jacob Drive, Knoxville TN 37996-4542, UT Institute of Agriculture, Center for Renewable Carbon (CRC), BeST Conference Room (103) – Located next to UT Gardens on campus (See Map on Page 2)

5:00 pm Arrival and tour of facilities with poster presentations by graduate and undergraduate students
6:00 pm Pizza and soft drinks at the CRC
6:30 pm Brief welcome by CRC Director
6:45 pm Program – Kasey Krouse, City of Knoxville, *Urban Forestry Program*
7:45 pm Executive Committee Meeting (All members welcome)

Abstract^a – People come from around the world each year to visit the forests of East Tennessee. These forests are known for species diversification and brilliant tree specimens. The trees of East Tennessee help identify the region as thriving in natural resources and rich from the benefits those trees provide. East Tennessee is where northern deciduous forests meet the southern temperate forests, and various precipitation patterns occur over a range of altitudes which makes the City of Knoxville a perfect environmental canvas for a distinguishing urban forest.

The concept of Urban Forestry is not new to Knoxville. The City of Knoxville and local folks have been planting trees for years for multiple reasons. Through time, the understanding of tree benefits and the importance of trees has greatly evolved. Trees are no longer only valued for their beauty and shade, but a new wave of environmental, economic, and social benefits are being recognized. Trees are one of the few City assets that increase in value through time. The City of Knoxville has recognized the importance of properly investing in trees, and has developed an Urban Forestry Division through the Public Service Department to plant, manage, and protect these valuable assets

A presentation on the City of Knoxville Urban Forestry Program will be given. The presentation will cover the programs mission and objectives and include discussion of the protection, maintenance, and preservation of trees throughout the City, as well as upcoming projects and goals for the coming year.

Bio – See Page 9

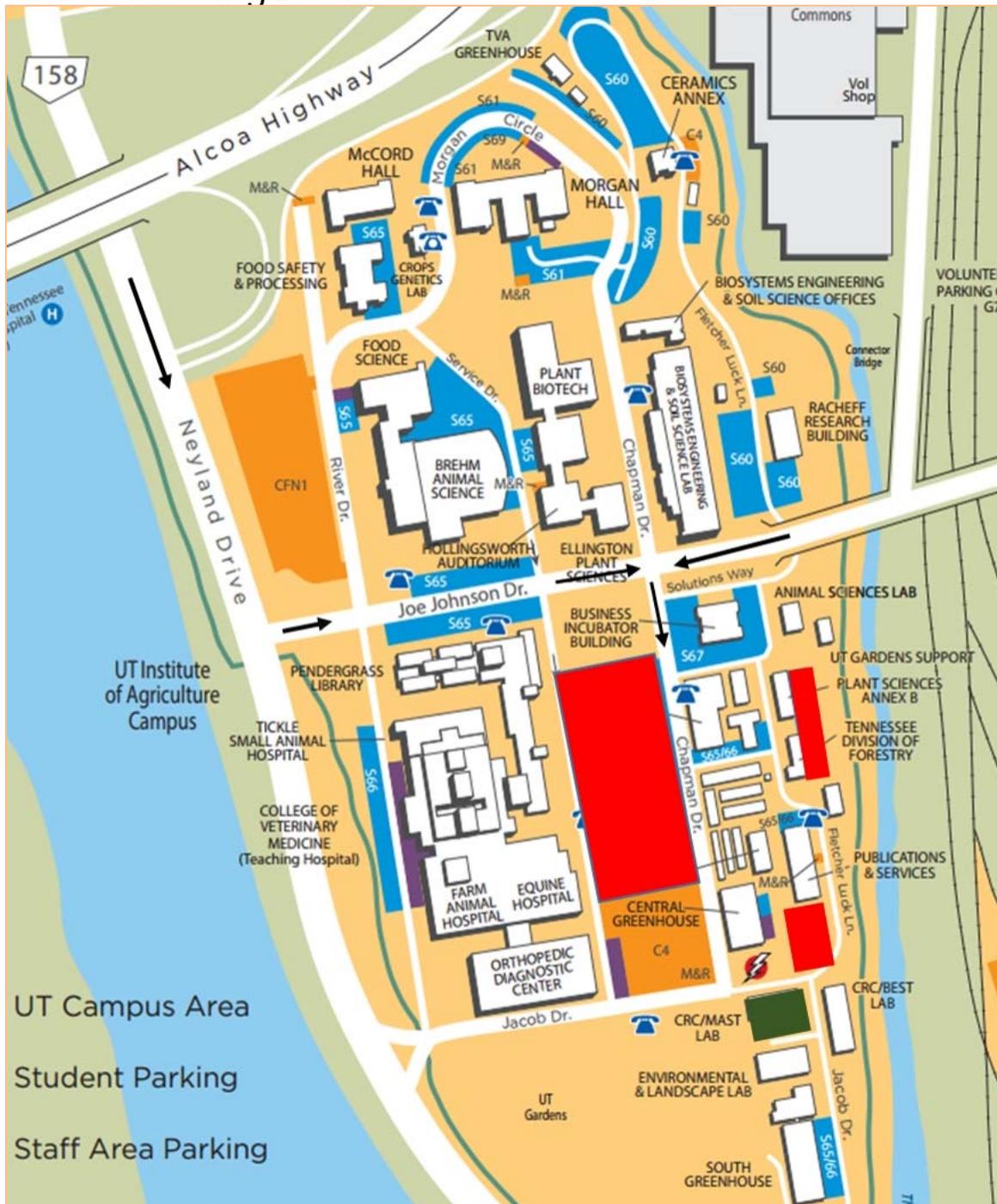
**Please make your reservations no later than noon on
March 15 by contacting**

Paul Taylor, taylorpa@ornl.gov, (865)574-1965 or
Amber Tipton, atipto11@utk.edu, 974-6458

**The Section will subsidize up to 15 students, including
graduate students**

^(a)Portions of Abstract taken from:
http://www.knoxvilletn.gov/government/city_departments_offices/public_service/urban_forestry/

Map to March Meeting Location



- Center for Renewable Carbon
- Staff lot 65/66 available for parking
- Directions to staff 65/66 parking lots when coming either from Neyland Drive or the main campus across the bridge

Even though parking is open to everyone after 5 p.m., 30 parking passes have been secured for participants to park in any of the staff parking areas marked S65/S66. There are several around the center for renewable carbon (CRC). The closest parking areas are marked in red. Someone will be available to provide parking passes either at the door of the CRC or at the lots as people arrive.

Volunteer Opportunities (Continued on page 10)

If you would like to support your local section of AIChE, there are several opportunities for service. The section is currently seeking volunteers to chair and participate in the following activities:

Social Media Committee –

The local section desires to establish a presence on various social media outlets, such as: Facebook™, Twitter™, LinkedIn™, and YouTube™. The Knoxville-Oak Ridge Section is seeking volunteers to chair and participate on the Social Media Committee. The committee chair will serve as the point of contact and work with the committee to establish and maintain a presence for the local section in various social media outlets. The Chair of this committee would be responsible for recruiting committee members, setting up social media outlets, establishing and managing content, and implementation of all social media activities for the section.

Young Professionals

Committee – The local section desires to establish a Young Professional's Group to increase participation and interactions with young chemical engineers within the East Tennessee region. The Knoxville-Oak Ridge Section is

seeking volunteers to chair and participate on the Young Professionals Committee. The committee will establish a Young Professional's Group within the local section. The Chair of this committee would be responsible for recruiting committee members, coordinating activities for the group, developing a budget for the committee, working with the Social Media Committee to publicize group activities, planning of activities, and coordination with the local section.

Webmaster – A volunteer is needed to assume the responsibility for the maintenance and updating of the Knoxville-Oak Ridge Section website. The site is presently hosted by Oak Ridge National Laboratory. However, the National AIChE has offered to host local section websites and transfer currently stored content. A volunteer is needed to lead this effort and subsequently to maintain site.

Southern Appalachian Science and Engineering Fair (SASEF)

– The Knoxville-Oak Ridge Section awards two \$75 prizes for the best chemical engineering related posters in the Junior and Senior Divisions. Anyone who would like to help judge for the

AIChE awards can register using the Google Form at: <http://goo.gl/forms/3VF4ukuBF8>. Judging will occur the afternoon of April 5th at the Thompson Boling Arena.

Notes:

- A single registration form is now used for Category Judges *and* Special Local Awards. Most people viewing this information are not in the Local Special Awards category. If you are not sure, then you probably are not a Local Special Awards judge, so check 'No' on that question and go on to the Category Judge preferences.
- We do not share your information with anyone. We only use your e-mail address to contact you regarding SASEF, and your cell phone number is used only to contact you during the judging process (For example, sometimes we can't find a Lead Judge during/after dinner when their deliberations are taking place).
- The SASEF website (<https://aq.tennessee.edu/sasef/Pages/default.aspx>) says we will have judges' assignments done by March 15. That is a goal,

Local Section Volunteers Help Boy Scouts Earn Chemistry Badges

Local Section members, Paul Taylor and Mark Swientoniewski, helped 17 Boy Scouts earn a chemistry merit badge on February 20th, as part of the Roane State Merit Badge College (MBC). The scouts learned about chemical safety, inorganic chemistry, organic and biochemistry, analytical chemistry, and environmental chemistry. They participated in hands-on demonstrations of electrodeless plating of copper metal onto a steel nail, neutralization and precipitation of iron hydroxide from coal yard runoff, paper chromatography to separate inks, a Cartesian diver that demonstrates the impact of pressure on buoyancy, and the impacts of cooking an onion. The MBC is held each February at the Harriman campus of Roane State Community College. Scouts can select from over 30 different merit badges that are taught at the MBC. This year's event was the largest MBC ever with over 1,100 scouts and scouters in attendance.

UT Student Poster Presentations at March Meeting

A number of students from the University of Tennessee Center for Renewable Carbon and one student from Chemical and Biomolecular Engineering Department will present posters on their research at the March meeting of the Knoxville-Oak Ridge Section of AIChE. Poster abstracts and biographical summaries for the presenters are given below. You will have an opportunity to talk with these students about their work at 5:00–6:30 p.m. or after the program.

Direct Film Formation from Biomass-Ionic Liquid Solution

Jing Wang^{a,b}, Ramiz Boy^c, David Harper^a, Amit Naskar^{a,c}, Timothy Rials^a, and Nicole Labbé^a

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^bBiosystems Engineering and Soil Science Department, University of Tennessee, Knoxville, TN

^cMaterials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN

Lignocellulosic biomass has been investigated as renewable feedstock to produce bio-based materials. Although various biomass-based materials have been developed, there is still a challenge to directly convert biomass into high value-added materials because lignocellulosic biomass has poor solubility in common solvents. Ionic liquids (ILs) have been investigated and developed as a media to dissolve and pretreat lignocellulosic biomass. In this study, autohydrolysis of the biomass was conducted prior to the IL dissolution step. Autohydrolyzed biomass was completely dissolved in 1-ethyl-3-methyl imidazolium acetate ([C₂mim][OAc]) at 100 °C. Lignocellulosic biomass films were casted directly from the autohydrolyzed biomass-[C₂mim][OAc] solution and coagulated by either water, N,N-Dimethylacetamide (DMAc)/water mixture or methanol. To avoid the cracks and wrinkles, the films were dried over a sequence of saturated salt solutions creating different humidity. The physicochemical properties of biomass films were characterized by Fourier transform infrared spectroscopy, scanning electron microscope, X-ray diffraction, thermogravimetric analysis, differential scanning calorimetry, dynamic mechanical analysis and tensile testing. The film coagulated by water bath had higher lignin content than films coagulated by DMAc/water bath or methanol bath. Better thermal and mechanical properties were observed for films coagulated by DMAc/water bath or methanol bath.

About Jing Wang

Jing Wang is a fourth year PhD student, working with Dr. Nicole Labbé and Dr. Douglas G. Hayes in the Center for Renewable Carbon and in the Department of Biosystems Engineering and Soil Science at The University of Tennessee, Knoxville. She earned a Bachelor's degree and a Master's degree of Engineering in the Northeast Forestry University, China. Her research focuses on biomass fractionation and biomass-based products through ionic liquid process.

Exploring transition metal carbides and phosphides for Ex-Situ catalytic fast pyrolysis

Yagya N. Regmi, Stephen C. Chmely and Nicole Labbé

Center for Renewable Carbon, University of Tennessee, Knoxville, TN

Carbides and phosphides of earth abundant transition metals, such as Mo₂C and Ni₂P, have garnered much scientific attention in the last decade as electrocatalysts for the hydrogen evolution reaction (HER) via water splitting. Although these compounds have been explored as biomass upgrading catalysts for model compounds via hydrodesulfurization (HDS), hydrodenitrogenation (HDN), and hydrodeoxygenation (HDO), the catalytic properties of these catalysts have not been extensively explored. One of the main stumbling blocks for biomass derived oils finding wider use in energy generation is the presence of significant amount of oxygen, unlike in petroleum. HDO is one of the processes to alleviate this problem, and HER and HDO both proceed via hydrogen adsorption on the catalyst surface. Thus, it is prudent to explore good HER catalysts for HDO via fast pyrolysis. This presentation will be based on the initial findings from pyro-GC/MS analysis of poplar lignin using Mo₂C and Ni₂P as catalysts. Additionally, an effort will be made to explain future goals and expected outcomes.

UT Student Poster Presentation at March Meeting (continued)

About Yagya Regmi

Yagya N. Regmi is Postdoctoral Research Associate at the Center for Renewable Carbon (CRC) within the Institute of Agriculture at the University of Tennessee, Knoxville. He was awarded a doctoral degree in inorganic chemistry from the University of Wyoming in 2015. His PhD work primarily involved the synthesis, characterization and electrocatalytic activity optimization of earth abundant transition metal carbides and oxides. Dr. Regmi has been working on designing carbide and phosphide catalysts for Ex-Situ catalytic fast pyrolysis of biomass at the Center for Renewable Carbon since January 2016. He is also collaborating with chemistry, chemical engineering and biosystems engineering faculties to look at various intermetallic, carbide, oxide and phosphide catalysts as prospective energy conversion and storage materials. Dr. Regmi plans to pursue an academic and/or research career in renewable energy after the completion of his postdoctoral training.

Exploring the Potential of Hot Water Extraction on Switchgrass Inorganic Removal Before Thermochemical Conversion

Qiaoming Liu^a, Stephen Chmely^b, Nicole Labbé^b and Nourredine Abdoulmoumine^{a,b}

^aBiosystems Engineering and Soil Science Department, University of Tennessee, Knoxville, TN

^bCenter for Renewable Carbon, University of Tennessee, Knoxville, TN

During thermochemical conversion, the presence of biomass derived inorganic impurities in the gas and liquid products leads to technical challenges ranging from undesirable emissions, agglomeration, equipment corrosion and catalyst poisoning. In the past, various pretreatment strategies have been employed reduce biomass inorganic before biomass conversion including acid washing, inorganic passivation and salt doping to reduce or control inorganic release during thermochemical conversion.

This study investigates the potential of hot water extraction (HWE) as a chemical-free inorganic pretreatment method for reducing inorganics in switchgrass. Hot water extraction was carried out at different temperatures (60, 80, 100, 120 and 140 °C) and times (15, 30, and 45 min) to evaluate the effect of extraction severity on ash content, mass loss and liquor pH. The ultimate goal of this study is to optimize the HWE process to minimize mass loss and energy consumption while maximizing inorganics reduction. Overall, the ash content of switchgrass decreased with pretreatment severity as the liquor pH decreased.

About Qiaoming Liu

Qiaoming Liu is a master's student in Biosystems Engineering and Soil Science Department at the University of Tennessee working with Drs. Nourredine Abdoulmoumine and Stephen Chmely. She obtained her bachelor degree in Agricultural Engineering at the China Agricultural University. Qiaoming's scientific and extracurricular interests include biomass processing, energy and sustainability, hiking, skydiving and running. Her thesis project focuses on strategies to reduce biomass inorganic impurities before and after thermochemical conversion.

Design, Integration and Computational Fluid Dynamic Modeling of a Bench-Scale Fluidized Bed Reactor for Biomass Pyrolysis and Gasification

Oluwafemi Oyediji^a and Nourredine Abdoulmoumine^{a,b}

^aBiosystems Engineering and Soil Science Department, University of Tennessee, Knoxville, TN

^bCenter for Renewable Carbon, University of Tennessee, Knoxville, TN

Bench-scale integrated pyrolysis and gasification biomass systems are becoming increasingly important for rapid screening of biomass feedstocks and collection of meaningful process data. In this work, we present the development and analysis of an integration bench-scale biomass

UT Student Poster Presentation at March Meeting (continued)

thermochemical conversion platform designed for various pyrolysis, gasification and catalytic upgrading applications. The thermochemical conversion platform consists of a variable speed biomass feeding mechanism, a high temperature (up to 1100°C) and corrosion resistant fluidized bed reactor made of a high-strength alloy, high temperature vapor-biochar filtration, dual fixed-bed catalytic reactors, shell and tube heat exchangers with sampling ports, dual electrostatic precipitators with a 50 kV voltage supply to coalesce aerosols and a turn-key control panel with redundancy safety features built-in.

In addition to the design and integration of the thermochemical conversion platform, a based computational fluid dynamics (CFD) model was applied to simulate and evaluate biomass gasification process variables (*i.e.* temperature, pressure, velocity, and chemical species distribution) using an open source CFD package, OpenFOAM®. The OpenFOAM® transient three dimensional CFD model used the Eulerian-Eulerian multiphase approach and accounted for particle interactions, heat and mass transfers and chemical reactions. The flow phenomena and description of particle collisions were simulated by standard κ - ϵ turbulence model coupled with the kinetic theory of granular flow while the homogeneous and heterogeneous reactions were resolved using the conservation laws of chemical species. Finally, simulation results were compared with available data in the open literature for a wide range of gasification conditions.

About Oluwafemi Oyedeji

Originally from Ekiti State in Nigeria, Oluwafemi Oyedeji is a PhD student in Biosystems Engineering and Soil Science at the University of Tennessee working Dr. Nourredine Abdoulmoumine. He earned his bachelor in Agricultural Engineering from the Federal University of Technology in Akure, Nigeria in 2011 and his master's in Biosystems Engineering from Auburn University in 2015. Prior to joining the Biosystems Engineering and Soil Science Department, Oluwafemi worked with Dr. Erin Webb in the Energy and Environmental Sciences Division of Oak Ridge National Laboratory as a post-masters' researcher investigating field drying potential of corn stover for bioenergy production. He is currently working on understanding and simulating the evolution of products during biomass thermochemical conversion. Other interests include biomass characterization and preprocessing, cost effective thermochemical conversion of biomass to transportation fuels, chemicals, and materials and country music. He is a member of the American Society of Agricultural and Biological Engineers and the Nigerian Institution of Agricultural Engineers.

Effect of High Surface Area Carbon Addition to the Performance of a Non-Precious Metal Catalyst in a PEM Fuel Cell

Christopher A. Neal^a, Nelly Cantillo^a, Shengqian Ma^b, Gabriel A. Goenaga^a and Thomas A. Zawodzinski^{a,c}

^aChemical and Biomolecular Engineering, The University of Tennessee, Knoxville, TN,

^bChemistry, The University of South Florida, Tampa, FL,

^cPhysical Chemistry of Materials Group, Oak Ridge National Laboratory, Oak Ridge, TN

In Polymer Electrolyte Membrane Fuel Cells (PEMFCs) the structure and morphology of the electrode layer play an important role in the value of the electrochemical resistance, which has an impact in the cell performance. These effects become particularly relevant when the cathode catalyst is based on a non-precious metal due to the higher catalyst loadings required to compensate for the lower catalytic activity when compared to Pt based catalysts. In previous experiments performed in our lab, a pyrolyzed iron (III) porphyrin framework (PCPF-Fe) material was characterized, exhibiting a good single cell performance. In this study, the addition of a high surface carbon to the PCPF-Fe was conducted in an attempt to increase the surface area and the electron conductivity and, consequently, improve the activity and stability. For this purpose, as-synthesized PCPF-Fe was mixed with Ketjenblack (KJB) carbon to four different ratios, pyrolyzed and its catalytic activity towards the ORR was evaluated using rotating ring disk electrode (RRDE) experiments. The structure and morphology

of the catalyst layer were analyzed through scanning electron microscopy (SEM), and X-Ray Diffraction (XRD). The best performed mixture was 50% PCPF-Fe, and exhibited a comparable onset potential and a higher limiting current density (-4.6 mA/cm^2 in the 100% vs. -6.0 mA/cm^2 in the 50%) to that of the pure material. The material was then used as the cathode electrode in a single cell. The maximum current density obtained in single cell test for the 50% PCPF-Fe was only a third of that obtained with a 100% PCPF-Fe (0.25 A/cm^2 vs. 0.81 A/cm^2) cathode with the same catalyst loading, which could be associated to a lower density of catalytic centers in the mixture.

About Christopher A. Neal

Christopher Neal is a sophomore working since his freshman year under Dr. Gabriel Goenaga's supervision in Dr. Zawodzinski's lab in the Chemical and Biomolecular Engineering Department at the University of Tennessee Knoxville. He is interested in electrochemical energy storage and conversion devices; more specifically, his work examines non-precious metal catalysts in the cathode of Proton Exchange Membrane Fuel Cells as an alternative to platinum-based catalysts. Neal presented his research and won 1st place in the poster competition at the 2016 AIChE National meeting in Salt Lake City. He hopes to continue his education into Graduate School to earn a Ph.D. in Chemical Engineering.

Resolving hydrodynamic transitions in bubbling bed biomass pyrolysis reactors

Emilio Ramirez^a, C. Stuart Daw^a, Charles Finney^a, and Sreekanth Pannala^b

^aOak Ridge National Laboratory, Oak Ridge, TN

^bSABIC (Saudi Arabia Basic Industries Corporation), Sugar Land, TX 77478 USA

Quantifying bubbling intensity in bubbling bed biomass pyrolysis experiments is vital for optimizing chemical product yields. Non-intrusive measurements to detect the bubbling-to-slugging transition are necessary to characterize hydrodynamics in bubbling beds. Eulerian-Eulerian simulations of a lab-scale bubbling fluidized bed of Geldart Group B particles were carried out with MFIX (Multiphase Flow with Interphase eXchanges) to investigate the physics of the bubbling-to-slugging transition. Time series pressure measurements and bubble statistics from multiple axial locations were evaluated to reveal the changes in their dynamic and statistical character as gas flow was increased from minimum fluidization to several times the minimum. Even though several correlations have been proposed in literature to predict the onset of slugging, our simulated pressure time series measurements and bubble statistics revealed subtle features and details about the physics of the transition that have not been previously reported. Two of the most interesting statistical patterns observed were associated with the pressure and bubble size histograms. These patterns might be useful in the future for diagnostic purposes, but they appear to vary significantly depending on where the measurements are made. Because the bubbling-to-slugging transition is often of great practical importance in the operation of many types of fluidized bed reactors, we propose that further computational studies of this type, in conjunction with carefully designed experiments, are warranted.

About Emilio Ramirez

Emilio is a PhD Candidate in Energy Science and Engineering in the Bredesen Center, a joint program between the University of Tennessee, Knoxville and Oak Ridge National Laboratory. He earned his bachelor's in Mathematics from University of California, Santa Barbara. Prior to joining the Bredesen Center he operated and maintained an industrial 24 MWe biomass combustion fluidized bed, where he created empirical models to optimize and increase plant reliability. He also interned at the National Renewable Energy Laboratory, where he developed a pilot scale biomass gasification catalytic reactor model using ANSYS Fluent. Currently he is using MFIX, an open source Fortran computational fluid dynamics code, to improve mixing, heat transfer, and chemistry in fluidized bed biomass fast pyrolysis reactors. He works with experimentalists at the National Renewable Energy Laboratory and the National Energy Technology Laboratory to validate fluidized bed simulations. He is a member of the Computational Pyrolysis Consortium, a multi-laboratory, multi-scale, computational modeling collaboration to improve bio-oil quality, upgrading catalyst, process integration, and scale-up (<http://cpcbiodmass.org/>).

March 2016 Meeting (Continued)

Bio – As the Urban Forester for the City of Knoxville, Tennessee, Mr. Krouse is responsible for the expansion, protection, and maintenance of the City's urban forest and implementing the City's Urban Forest Management Plan. He is charged with updating and overseeing and providing advice on policy, specifications, and programs as it relates to public trees within the City of Knoxville.

As the Urban Forester, Mr. Krouse oversees the City's planting projects, adhering to proper tree installation and follow-up maintenance. Mr. Krouse is also responsible for responding to resident concerns about hazardous trees throughout the City, and conducting tree risk assessments to determine proper mitigation for high risk situations specific to public trees. He is also responsible for the development and implementation of public education events that relate to the City's urban forest. As the Urban Forester, he will work with residents as well as local, state and federal stakeholders to expand urban forestry resources within the City. Mr. Krouse is a *Certified Arborist* and *Municipal Specialist* (IN-3243AM) with the International Society of Arboriculture.

Mr. Krouse worked as a consultant and project manager for six years with Davey Resource Group where he has assessed thousands of trees throughout the eastern United States, to determine tree condition, health, risk factors, and maintenance needs. As an urban forestry consultant, Mr. Krouse has also performed individual tree risk analysis, tree and shrub landscape appraisals, and conducted tree forensic consultations. While a consultant with Davey Resource Group, Mr. Krouse conducted wetland delineations, managed invasive species control projects for forest, upland, and aquatic habitats, and was involved in several wetlands enhancement and restoration projects throughout the Midwest.

Education

- B.S., Biological Sciences (Urban Forestry), 2006, Purdue University, West Lafayette, Indiana

Certifications/Special Training

- *Certified Arborist* and *Municipal Specialist* (IN-3243AM), International Society of Arboriculture, January, 2007
- Davey Institute of Tree Sciences, 2010, Davey Tree Expert Company, Kent, Ohio
- Wetlands Delineation Training, 2010, Wetlands Training Institute, Toledo, Ohio
- Forest Inventory and Analysis Training, Phase 2 Inventory Plots, United States Forest Service, November, 2007
- Introduction Knoxville, February, 2013
- Knoxville CAC Community Leadership Class 2015

Professional Organizations

- International Society of Arboriculture
- International Society of Arboriculture Southern Chapter
- Society of Municipal Arborists
- Tennessee Urban Forest Council
- Keep Knoxville Beautiful- Beautification Committee

Volunteer Opportunities (Continued)

- but we are usually still recruiting judges at then.
- We need about 100 category judges registered in order to make reasonable assignments for all judges. Your assistance recruiting judges will be appreciated.

Judging schedule:

Tuesday, April 5 — ("Judgment Day!") at Thompson Boling Arena Floor
 12:30 - 1:00 p.m. — Judge Assembly for instructions
 1:00 - 3:00 p.m. — Open floor for judges (no students)
 3:00 - 5:00 p.m. — Judges interview students
 5:00 - 6:00 p.m. — Judges submit score sheets, judges for each category meet to choose category winner and recommend projects for higher awards
 5:30 - 7:00 p.m. — Dinner provided (buffet)
 6:00 - 9:00 p.m. — Lead judges meet to choose final winners

Thursday, Apr 7 — from 5:30 p.m. to 7:00 p.m. — Awards Ceremony and Social (all judges are invited).

SASEF is the premier science and engineering competition for students in middle and high school in the 23-county service area of East Tennessee.

Call for EDP Reviewers for the AIChE Chem-E-Car Competition®

- AIChE's annual Chem-E-Car Competition® engages college students in designing and constructing a car powered by a chemical energy source that will safely carry a specified load over a given distance and stop. The competition

increases awareness of the chemical engineering discipline among the public, industry leaders, educators, and other students.

In addition to an onsite review, each student team is required to submit an engineering documentation package (EDP) in advance of the competition. The Chem-E-Car Competition® Committee is in need of volunteers to review at most 2 such packages; ensure they have been completed correctly, and that the safety rules of the competition have been followed. The total anticipated time estimate is 3 hours at the most. This is a great opportunity for those who are not able to make the competition in person due to travel restrictions to see the creativity displayed by the students in the competition. All of the EDP packages and instructions on how to review them are sent to volunteers electronically.

Online volunteers are sent a short copy of the safety rules, and would be reviewing the EDPs for compliance with safety rules and completeness. Volunteers are asked to provide general comments regarding the safety of the vehicle and the completeness of the package, which are passed along to the students who will have a chance to remedy any safety concerns before their car is judged onsite by a live safety inspector. A safety evaluation form will be provided to guide the review process.

EDP reviews will begin during the month of February, and over 120 EDPs are expected to be submitted for the 9

upcoming Regional Competitions in April 2016. If you are interested in helping AIChE conduct a safe Chem-E-Car program again this year, please send an email to Sarah Ewing at sarae@aiiche.org. This competition could not exist without the help of volunteers, and this review process will help keep students and bystanders safe before, during and after the competition. If you are aware of anyone that might be also interested in assisting, please pass this email on to them.

Below are the locations for the upcoming 2016 Regional Chem-E-Car Competitions. On Site Volunteers are always welcome! Please email Sarah Ewing for more details at: sarae@aiiche.org.

April 1st Weekend: University of Alabama-Tuscaloosa, Kansas State University and University of Arizona

April 8th Weekend: University of Houston and University of Delaware

April 15th Weekend: Miami University of Ohio, University of California-Riverside and University of Washington

April 22nd Weekend: University of Massachusetts-Amherst

Junior Achievement - If you've ever had a hankering to teach, here's your chance. Junior Achievement, a non-profit organization that educates and inspires young people to achieve their potential in school and in the future, is seeking volunteers to teach K-12 students in schools throughout the area about financial literacy, business and economic fundamentals, career exploration, and workplace competencies.

Volunteer Opportunities (Continued)

Volunteers present programs to expose students to a “real-world” perspective and serve as positive role models and mentors. JA will provide you with a step-by-step guidebook of lesson plans and all the student activity materials you need to lead the students through fun, hands-on activities centered on one of JA’s many free enterprise-themed programs. Teachers are present in the classroom and help reinforce your JA message.

Depending on the program and the grade level, teachers make one visit per week for a five to seven-week period. Teaching visits last 30-45 minutes depending on the program. For additional information visit the East Tennessee Junior Achievement web-site at: <http://www.jaeasttennessee.org/>.

FIRST Robotics - If teaching is not your thing, volunteer opportunities also are available March 30-April 2 at the FIRST Robotics event at Thompson Boling Arena in Knoxville. The mission of FIRST (For Inspiration and Recognition of Science and Technology) is to inspire young people to be science and technology leaders by engaging them in exciting mentor-based programs that build science, engineering, and technology skills, inspire innovation, and foster self-confidence, communication, and leadership.

To explore FIRST Robotics volunteer opportunities, such as field assembly/disassembly, crowd control, etc., visit <http://www.usfirst.org/community/volunteers>.

If you have an interest in any of these volunteer opportunities, please contact either one of the local section officers to express your interest or the indicated point of contacts above.

Activities Calendar

Date	Time	Topic	Speaker	Location
Mar 17	5:00 PM	Joint meeting with UT – Urban Forestry Program	Kasey Krouse	UT Ag Campus
Apr 14	5:30 PM	Energy Choices and Consequences	Harold "Lee" Dobbs, UT	Rothchild's, Knoxville TN
Apr XX		UT Department of Chemical & Biomolecular Engineering Awards Banquet		TBD
May 19	5:30 PM	TBD	TBD	McClung Museum

Sponsoring Opportunities

We continue to accept advertising in the newsletter in order to provide funds to support student participation in the meetings.

Rates per newsletter are:

\$80 full-page advertisement

\$45 half-page advertisement

\$25 quarter-page advertisement

The section will also continue to accept individual or corporate sponsors to provide student meals at section meetings. The sponsor will be recognized at the meeting and in the Newsletter.

The cost to sponsor one meeting is **\$200**. It's a great way to encourage students to attend the local meetings and become future members in the Institute!



(Tesla coil used for vacuum checks – Oak Ridge National Laboratory – Source: DOE Digital photo archive at: <https://www.flickr.com/photos/oakridgelab/page6>)

“Achievement seems to be connected with action. Successful men and women keep moving. They make mistakes, but they don't quit.”

Conrad Hilton

American hotelier and the founder of the Hilton Hotels chain
1887-1979

Officers

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Editor: B. Lewis

About Our Organization – AIChE Code of Ethics

The following was taken from the national AIChE website and is a reminder of our individual responsibilities to our colleagues, employers, clients, and the public.

Members of the American Institute of Chemical Engineers shall uphold and advance the integrity, honor, and dignity of the engineering profession by:

- Being honest and impartial and serving with fidelity their employers, their clients, and the public;
- Striving to increase the competence and prestige of the engineering profession;
- Using their knowledge and skill for the enhancement of human welfare.

To achieve these goals, members shall:

- Hold paramount the safety, health and welfare of the public and protect the environment in performance of their professional duties.
- Formally advise their employers or clients

(and consider further disclosure, if warranted) if they perceive that a consequence of their duties will adversely affect the present or future health or safety of their colleagues or the public.

- Accept responsibility for their actions, seek and heed critical review of their work and offer objective criticism of the work of others.
- Issue statements or present information only in an objective and truthful manner.
- Act in professional matters for each employer or client as faithful agents or trustees, avoiding conflicts of interest and never breaching confidentiality.
- Treat all colleagues and co-workers fairly and respectfully, recognizing their unique contributions and capabilities by

fostering an environment of equity, diversity and inclusion.

- Perform professional services only in areas of their competence.
- Build their professional reputations on the merits of their services.
- Continue their professional development throughout their careers, and provide opportunities for the professional development of those under their supervision.
- Never tolerate harassment.
- Conduct themselves in a fair, honorable and respectful manner.

(Source: AIChE website
<http://www.aiche.org/about/code-ethics>)

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